Construction Activity Impacts

Biological/Physical

Impacts — Air Quality

Construction impacts resulting from any of the proposals would be short-term and limited to the areas adjacent to the highway right of way.

Dust

Most fugitive dust emissions would settle on construction areas and their surroundings; however, a small percentage would contribute to Spokane area PM_{10} levels.

Slash Disposal/Burning

The Spokane County Air Pollution Control Authority prohibits open burning of construction waste or slash material. Emissions from trucks transporting this material off the site would create minor air quality impacts.

Odors

Equipment exhaust emissions and roadway paving would likely generate short-term construction-related odors. Little can be done to reduce these; however, impacts would be temporary and of short duration.

Emissions from Construction Equipment

Construction equipment powered by internal combustion engines would generate nitrogen dioxides, reactive organic gases, sulfur dioxide, CO, and PM_{10}. Detailed construction schedules and knowledge of the type, number, and duration of heavy equipment operation are necessary to quantify construction-related emissions accurately.

Mitigation — Air Quality

~~No impacts are expected. No mitigation is proposed.~~

Construction contractors would be required to comply with SCAPCA regulations to minimize air quality impacts associated with construction. Construction impacts would be reduced by incorporating mitigation measures into the construction specifications for the project.

Construction related air quality impacts will be controlled through strict adherence to regulatory guidelines. These will be incorporated into the construction specifications of the project. Typical control measures that will be used to reduce the particulate pollution caused by construction are sweeping, watering, traffic control, and use of well-maintained equipment. Surface streets will be maintained free of dirt, rocks, and debris from construction activities. Since the construction will be a temporary condition only, no other measures will be necessary to control emissions.

Construction noise impacts will generally be the same for all the alternative routes. Figure 4-68 illustrates noise levels produced by various types of construction equipment. Properly maintained equipment will produce noise levels near the middle of the indicated ranges. The types of construction equipment used for this project will typically generate noise levels of 80-90 dBA at a distance of 15 meters (50 feet) while the equipment is operating (Environmental Protection Agency 1971, Toth 1979, Gharabegian et al. 1985). Construction equipment operations can vary from intermittent to fairly continuous, with multiple pieces of equipment operating concurrently. Assuming that a bulldozer (87 dBA), back hoe (90 dBA), grader (90 dBA), and front-end loader (82 dBA) are operating concurrently in the same area, peak construction period noise would generally be about 94 dBA at 15 meters (50 feet) from the construction site.

Table 4-42 summarizes noise levels expected in the vicinity of an active construction site with the above equipment operating.

Distance Attenuation		Distance to dBA Contours	
Receptor Distance Meter (feet)	**Noise Level at Receptor (dBA)**	**Noise Contour Value (dBA**	**Contour Distance meter (feet)**
15 (50)	94.0	105	4.3 (14)
30 (100)	87.9	100	7.6 (25)
60 (200)	81.8	95	14 (45)
120 (400)	75.5	90	24 (79)
183 (600)	71.7	85	42 (138)
244 (800)	68.9	80	73 (240)
305 (1,000)	66.6	75	127 (417)
457 (1,500)	62.3	70	224 (736)
610 (2,000)	59.1	65	340 (1,115)
762 (2,500)	56.4	60	585 (1,918)
914 (3,000)	54.1	55	885 (2,902)
1,220 (4,000)	50.0	50	1,221 (4,006)
1,610 (5,280)	45.7	45	1,635 (5,365)
2,286 (7,500)	39.3	40	2,258 (7,407)
2,743 (9,000)	35.4	35	2,760 (9,054)
3,220 (10,560)	31.6	30	3,287 (10,785)
4,828 (15,840)	20.1	25	4,624 (15,170)

NOTES: The following assumptions were used:
Basic sound-level drop-off rate = 6.0 dBA/doubling.
Reference noise level = 94 dBA.
Distance for reference noise level = 15 meters (50 feet).

Attenuation effects from man-made barriers, natural land barriers, dense vegetation, and buildings are not included in the calculations. These barriers will substantially reduce noise when they intervene between the source and receivers.

Distance Attenuation for Construction Noise in the Project Area
Table 4-42

Locations within about 580 meters (1,900 feet) of a construction site will experience occasional episodes of noise levels greater than 60 dBA. Areas within about 225 meters (740 feet) of a construction site will experience episodes with noise levels greater than 70 dBA. Such episodes of high noise levels will not be continuous throughout the day and will generally be restricted to daytime hours.

The Spokane County noise ordinance specifically states that sounds resulting from public works projects are exempt from the noise provisions of the ordinance. The city of Spokane ordinance has no quantitative noise limits; it uses a subjective standard of annoyance to identify a potential violation for noise events that occur between 10 p.m. and 6 a.m. Most construction activities associated with the project would occur during daylight hours, minimizing the number of noise impacts as defined by the city. Incidents of noise conflicts may occur when construction directly adjacent to residential, park, or recreational areas is necessary.

The stables for the Playfair Racetrack would be about 150 meters (500 feet) from the freeway alignment. The track would be about 1,000 feet from the alignment, and the seating area would be about 490 meters (1,600 feet) from the alignment. Given the distance to the seating area, it is unlikely that construction noise will be substantial enough to disrupt public address announcements at the track. Loud, unexpected noise has the potential to disturb horses in the stables. Construction noise would be primarily from earth moving equipment and would tend to be fairly steady in nature. Research on the effects of noise on animals has been limited; however, research that has been conducted indicates that most farm animals, including horses, adjust well to noise. Consequently, construction noise is not anticipated to have an adverse effect on the horses.

Demolition of existing buildings may be required to clear the right of way for the freeway alignment. Demolition should not be substantially noisier than the construction activities described above, unless wrecking balls or explosives are used.

Mitigation — Noise

To reduce temporary noise impacts associated with construction, the contractor will be required to comply with all federal, state, and local regulations relating to construction noise. The following measures would be incorporated into contract specifications to help reduce the effects of construction noise:

- All equipment would have sound control devices no less effective than those provided on the original equipment.
- As directed by WSDOT, the contractor would coordinate with operators of the Playfair Racetrack so that loud unexpected noise during demolition activities would not occur at times when horses are racing or, if possible, when horses are housed at the track.
- As directed by WSDOT, the contractor would implement appropriate additional noise mitigation measures, possibly including changing the location of stationary

construction equipment, shutting off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, or installing acoustic barriers around stationary construction noise sources.

CONSTRUCTION EQUIPMENT	*Noise Level (dBA) at 50 feet*					
	60	*70*	*80*	*90*	*100*	*110*
EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES						
Earth Moving						
Compactors (rollers)						
Front loaders						
Backhoes						
Tractors						
Scrapers, graders						
Pavers						
Trucks						
Material Handling						
Concrete mixers						
Concrete pumps						
Cranes (movable)						
Cranes (derrick)						
Stationary						
Pumps						
Generators						
Compressors						
IMPACT EQUIPMENT						
Pneumatic wrenches						
Jack hammer and rock drills						
Pile drivers (peaks)						
OTHER						
Vibrators						
Saws						

Construction Equipment Noise Levels
Figure 4-76

Impacts — Energy

Impact on Local Fuel Availability and Production

Total projected Spokane County vehicle energy consumption for the 23-year period of construction is 1,507,665,317 giga joules (1,428,991 billion BTU). It appears that energy consumption during construction of the proposed project would not have a significant impact on energy sources, fuel availability, or production sources in the local area. There is no need to develop additional energy sources to supply fuel for construction of the proposed project. This conclusion is based on the assumption that proper fuel supply plans are developed by construction contractors during key phases of construction.

For example, the highest energy consumption alternative, the Market/Greene Alternative with North Option, would consume approximately 9,408,988 giga joules (8,918 billion BTU), only 0.6 percent of Spokane County's projected vehicle energy consumption during the 23-year period of construction.

Energy Resources Needed

No-Build Alternative

The No-Build Alternative assumes there will be short-term minor reconstruction activities and safety improvements to maintain existing north/south arterials. No major construction work is assumed. This alternative would not require an initial energy investment for construction.

"Build" Alternatives

Energy consumption estimates for construction of each build alternative are shown in Table 4-43.

Mitigation — Energy

No mitigation measures are required for the construction phase of the proposed project because construction impacts are not significant. However, proper energy supply planning by contractors for the key phases of construction will further minimize the impact on local fuel availability.

Impacts — Geology and Soils

Erosion

Market/Greene Alternative (Preferred Alternative)

There is little or no erosion hazard associated with the soils that make up most of this route (Garrison gravelly loam south half and Marble sandy loam north half). When water enters the soil system, it infiltrates rapidly. The rock outcrop area between Francis Avenue and Lincoln Road can be expected to have slight erosion problems.

Market/Greene (Preferred Alternative) — North Option

No significant water erosion is expected. Although a large percentage of the soil types along this route tend to collect water on the surface, once the water has

entered the drainage system, it infiltrates quickly. Eighty percent of this route contains sand dunes that could present a severe wind erosion problem if not properly stabilized.

Energy Consumed	Energy Consumed giga joules (billion BTU)
No-Build Alternative	N/A
Market/Greene Alternative with North Option	9,408,988 (8,918)
Market/Greene Alternative with South Option	8,782,284 (8,324)
Havana Alternative with North Option	8,937,378 (8,471)
Havana Alternative with South Option	8,149,251 (7,724)

NOTES: N/A = not applicable

Market/Greene and Havana Alternative include the C-D construction energy.

The following assumptions were used:

Basic sound-level drop-off rate = 6.0 dBA/doubling.

Reference noise level = 94 dBA.

Distance for reference noise level = 15 meters (50 feet).

Attenuation effects from human-made barriers, natural land barriers, dense vegetation, and buildings are not included in the calculations.

These barriers will substantially reduce noise when they intervene between the source and receivers.

Estimated Energy Consumption during Construction NSF Project During the Construction Period 1997-2020

Table 4-43

Market/Greene — South Option

No significant water erosion is expected along this route. For most of the soils present, water entering the drainage system infiltrates rapidly. The marble loamy coarse sand dunes may have a severe wind erosion problem if not properly stabilized.

Havana Alternative

Soil types that make up this route drain surface water slowly and water tends to collect at the surface for long periods of time. Once in the soil, the water moves slowly. The soil in the area of Francis Avenue at Havana Street is Peone silt loam, which has a tendency to be saturated in the winter and spring, subjecting the area to flooding. Minor erosion can be avoided by proper stabilization.

Havana — North Option

See Market/Greene — North Option.

Havana — South Option

See Market/Greene — South Option.

I-90 Collector/Distributor (C/D) System (part of the Preferred Alternative)

When water enters the Garrison gravelly loam soil found here, it infiltrates rapidly. The soil along the I-90 C/D has minimal potential for wind or water erosion.

Slope Stability

Market/Greene Alternative (Preferred Alternative)

Appropriately designed cut and fill sections are not expected to present problems during construction.

Market/Greene — North Option (Preferred) and South Option

There will be a cut to the east of the intersection of Market Street and Magnesium Road. This cut will be partly through gneiss bedrock similar to that in Beacon Hill. Slope stability calculations will be necessary in the geotechnical engineering analysis to predict and avoid or stabilize potential landslide areas in cuts through unconsolidated soils.

Each option also involves a cut as the roadway drops down to intersect US 395. The proposed South Option cut between US 2 and US 395 passes through Springdale gravelly sandy loam; with proper design, the cut slopes will not have landslide potential. North of the Springdale soil is Hardesty silt loam, with low stability. The preliminary design cut through this soil is shallow; therefore, shallow side slopes may be used to enhance slope stability.

Havana Alternative

From Minnehaha Park heading north, this alignment parallels the Beacon Hill ridge. The bedrock is gneiss, with varying degrees of weathering and competency. The proposed alignment includes a cut approximately 0.80 kilometer (one-half mile) long.

Construction will follow the recommendations of a geotechnical engineering report based on adequate geotechnical exploration of the study area. The available information is not definitive enough to make specific recommendations on slope stability, although a report for a tunnel alignment to the east of the proposed route recommended a 0.25:1 temporary slope. Additional slope stability calculations will be necessary to predict potential landslide areas and avoid or stabilize cuts through unconsolidated soils.

Havana — North Option and South Option

See Market/Green North Option and South Option.

I-90 Collector/Distributor (C/D) System (part of the Preferred Alternative)

The cut and fill sections along this corridor are not expected to present problems during construction. However, routine slope stability calculations are advised.

Compaction

Each of the study routes requires construction of bridges, ramps, viaducts, and overpasses on the glacial out-wash. Foundations for these structures will be required to have minimal settlement. Adequate structure foundations will be part of the alignment design. With proper design, effects of vibration from heavy machinery, including compaction equipment on adjacent properties, should be minimized.

None of the geological features or soil types exhibit load bearing capacities that would adversely affect structure foundations or alignment design. However, detailed site-specific geotechnical studies will be conducted prior to design of any structures. Geotechnical design specifications should be similar to those used in the recent construction on US 2 and US 395 north of the project.

Topography

Topography will be altered as a result of cut and fill slopes, embankments, material excavation (on or off site), disposal of waste materials, retaining walls, cutting, and trenching. Alterations to the terrain have the potential to increase erosion characteristics of the ground surface and can alter surface water flow.

Market/Greene Alternative (Preferred Alternative)

This alignment would not substantially alter topography. The same fill and viaducts required for the Havana Alternative are required at the I-90 interchange and north through Mission Street, across the Spokane River. A cut section is required through a grade of less than one percent to Wellesley Avenue, where it levels off, then drops in another cut with a slight slope to Francis Avenue and on to the end of the alignment.

Havana Alternative

Topography would be altered considerably by this route, since it parallels a mountain ridge. Fill and viaducts are required at the I-90 interchange and north through Mission Street, across the Spokane River. A large volume of fill is required north of the river to accommodate an estimated 3.7 percent grade climb around the west base of Beacon Hill. This fill section will be approximately 18 meters (60 feet) thick at the base and have about a 27 meter (90-foot) cut at the top. There are additional fill sections along the rest of the route.

Market/Greene and Havana — North Option

This alignment requires a cut approximately 610 meters (2,000 feet) long and over 30 meters (100 feet) deep to the east of the intersection of Market Street and Magnesium Road. There would be minor cut and fill segments at Parksmith, and a fill section approximately 910 meters (3,000 feet) long from the Kaiser Aluminum Reduction Plant property to the intersection with US 2.

Continuing northwest of US 2, there is a cut to Farwell Road to accommodate interchange construction. The remaining section requires minor fill at the connection near Wandermere at the north terminus of the project.

Market/Greene and Havana — South Option

This alignment requires a cut approximately 760 meters (2,500 feet) long and 21 meters (70 feet) deep to the east of Market Street for the Market/Greene Alternative. The route proceeds northwest to the Hawthorne Road crossing, where the two alternatives merge. The Havana Alternative South Option does not require a cut until about 490 meters (1,600 feet) southeast of the Hawthorne Road crossing. From US 2, the grade passes through another cut, then over a fill section to a point about 460 meters (1,500 feet) south of the overpass at the intersection of US 395 and Hastings Road.

I-90 Collector/Distributor (C/D) System (part of the Preferred Alternative)

The I-90 C/D uses existing I-90 alignments and grades for through traffic, and existing alignments and grades of Second and Third Avenues for most of its route from Hamilton Street to the Sprague Avenue exit. The exception is near the interchange with the North Spokane Freeway in the vicinity of Thor and Freya Streets. Project elevations for the C/D follow existing Second and Third Avenue alignments, but fill is required from Havana Street to Thor Street and from Freya Street to approximately Julia Street, to allow the C/D to pass over Thor and Freya.

Sundry Sites

Specific pit or waste sites have not been identified for any of the alignments before construction, because it is not possible to predict what contractor will be awarded the job, what sites will be available, and price differences at the time of need.

The contractor may have access to a state site. If not, the contractor may choose a commercial or private site. The contractor must inform WSDOT of the location and name of the site, its capacity, and the quantity of material to be removed or disposed of at each site. The contractor must also submit the following environmental compliance documents to WSDOT:

- Compliance with State Environmental Policy Act (SEPA) WAC 197-11, October 1, 1984, including preparation of an environmental checklist of any applicable National Environmental Policy Act (NEPA) regulations.
- Guarantee of compliance with state and local government requirements.
- An approved reclamation plan to be submitted to the state before using any site.

There are no sand or gravel pits along the routes of the Market/Greene Alternative, the Havana Alternative, or the South Option. There are four sand pits and one gravel pit near the North Option alignment. The Havana Alternative may require a waste site for disposal of excess material extracted from the Beacon Hill cut, as this material may not be suitable for use as fill along the construction route.

Actual locations and usage of sand pits, gravel pits, demolition waste disposal sites, and stockpiles depend on project construction staging, which is yet to be determined.

Haul Routes

Standard WSDOT requirements for truck hauling and time of operations will be followed. All contractors will be required to obtain necessary permits and be in compliance with the rules and regulations of the issuing agency.

All activities will be coordinated between state and local agencies and the various contractors.

Mitigation — Geology and Soils

Best Management Practices (BMPs) will be used to mitigate potential impacts to geology and soils.

Market/Greene Alternative (Preferred Alternative)

A Temporary Erosion and Sedimentation Control Plan (TESC) would be prepared. This plan also includes an addendum covering controls (BMPs) for pollutants other than sediment, to ensure construction practices do not allow surface and ground water contamination by hazardous materials. If staging areas are within the right of way, the contractor must submit a Spill Protection/Control Plan for approval, prior to beginning construction. A TESC is part of the Stormwater Site Plan; the site plan will meet the NPDES requirements. (Refer to the Water Quality section of the chapter for additional information.)

The I-90 interchange and some ramps along this alignment will require retaining walls to accommodate the changes in elevation required for these structures. Other cut and fill segments along this alternative will use slope stabilization methods such as, but not limited to, retaining walls or revegetation.

Market/Greene — North Option (Preferred Alternative)

A TESC Plan (see Market/Greene Alternative, above) would be prepared. Soil types exhibiting characteristics that result in flooding will be removed, drained, or selectively graded. Construction of freeway interchange ramps will require slope stabilization methods such as, but not limited to, retaining walls or revegetation. Dune sands on sensitive slopes will be covered by appropriate BMPs such as, but not limited to, wind erosion blankets/mats (natural or synthetic).

Market/Greene — South Option

A TESC Plan (see Market/Greene Alternative, above) would be prepared. Construction of freeway interchange ramps will require slope stabilization methods such as, but not limited to, retaining walls or revegetation. Dune sands on sensitive slopes with potential wind erosion will require additional BMPs.

Havana Alternative

A TESC Plan would be prepared. Standard slope stabilization methods will be used during major cutting through bedrock. Any blasting conducted will conform to industry standards. Precondition surveys will be conducted on buildings, utilities, and railroad tracks to ensure ground settlement does not affect them. Blasting activity will adhere to local noise ordinance and time restrictions. The I-90 interchange and some ramps along this alignment will require retaining walls to accommodate the changes in elevation required for these structures. In the low stability Narcisse and Spokane Association soils at either end of the Beacon Hill cut, retaining walls may be necessary to achieve slope stabilization.

Havana — North Option

See Market/Greene — North Option.

Havana — South Option

See Market/Greene — South Option.

I-90 Collector/Distributor (C/D) System (part of the Preferred Alternative)

A TESC Plan would be prepared. Retaining walls or other slope stabilization will be required in the area of the interchange with the North Spokane Freeway, to protect new embankments along the elevated sections of the I-90 C/D.

Impacts — Waterways and Hydrological Systems

Location and Meander Pattern

The locations of waterways and hydrologic systems along the Spokane River for both the Market/Greene and the Havana Alternatives will not be altered, because structures will span both the wetlands and the 100-year flood plain. Also, the meander pattern of the Spokane River (within both alternatives) would not be affected by construction of a new bridge. At Greene Street (Market/Greene Alternative), the river banks are already artificially stabilized.

Quantities and Flow Rates

In 1933, the Spokane River reached its maximum recorded discharge at 1,418,675 L/s (50,110 cfs) and still had little or no over the bank flooding.

Potential increases to the flow rates in the Spokane River and its tributaries, caused by increased runoff from new roadways during construction, will be avoided through the use of water quality/quantity BMPs.

Table 4-20 in the Waterways and Hydrological Systems of this chapter quantifies the expected soil infiltration capacity compared to the expected runoff (for a 10-year storm) on each of the major soil-type areas within the proposed project alignments. Runoff rates are shown in cubic meter per second per lineal meter of roadway edge.

Along Havana Street, there are two areas of roadway cuts in Spokane Extremely Rocky Complex and Spokane Very Rocky Complex soils that will drain only to the west side of the freeway right of way. The effective drainage flow rate will be approximately double that of areas where drainage is possible on both sides of the right of way. The result could be more storm water runoff than area available for infiltration, resulting in damage to channels and possible flooding near the project right of way.

The infiltration capacities that are marked by footnote in Table 4-20 are those where 12.7 millimeters (1/2 inch) of runoff would exceed the infiltration capacities of the native soil. Dry well capacities were not considered in these calculations; where the surface infiltration capacities are exceeded, the soil types along the project route are generally too impervious to consider dry well installation. Infiltration capacities in the proposed right of way will accommodate runoff in all but the following areas:

- Havana Alternative in the Beacon Hill cut
- South Option in the cut east of Market Street in the vicinity of Gerlach Road
- South Option at US 395

- North Option in the cut east of Market Street in the vicinity of Gerlach Road
- Collector/Distributor System

The South Option at US 395 is in Hardesty silt loam, which has very low permeability. In this area, dry wells constructed with bottoms more than 1.2 meters (4 feet) below natural grade would have adequate capacity to drain at 1.5 to 3.0 meters (5 to 10 feet) per hour, instead of 0.24 meter (0.8 feet) per hour typical of the surface layer. However, to comply with Spokane County's Guidelines for Storm Water Management, dry wells cannot be used without prior pre-treatment (e.g. grass swales).

Uses

There may be some temporary impact on usage of the Spokane River waterway during construction, particularly for boating. No other uses of waterways or hydrologic systems will be impacted.

Ground Water Movement

Construction methods should not affect ground water movement in the Spokane Aquifer. As noted in Table 4-20, infiltration capacities will be exceeded in some of the proposed right of way areas. Also as a result of construction, points directly below impervious surfaces may have reduced ground water flow, while points below areas next to impervious surfaces may have increased infiltration rates. However, the high flow rate of the Spokane Aquifer will dampen the effects that varying infiltration rates will have on lateral ground water flows.

Stream and Surface Drainage

Stream and surface drainage basin characteristics may be altered during construction. This includes changes to topography that could contribute runoff and sediment to a particular natural channel or stream. These changes in drainage patterns may result from construction of earth fill sections, culverts diverting flow in a direction other than the natural drainage pattern, runoff from bridges, and viaducts diverted away from the natural drainage course.

Mitigation — Waterways and Hydrological Systems

A Section 404 (Nationwide) Permit is required for piers within the Spokane River. Water quality/quantity impacts will be avoided by use of approved BMPs/construction methods. Communication with the Corps of Engineers indicates there are no major problems with pier construction within the waterway zones.

Presently approved bridge pier construction practices and BMPs will be used to avoid potential flood and ecological damage along the river. Presently approved techniques include, but are not limited to, cofferdams around pier foundations within waterway zones, prefabricated foundation elements, and pier construction being done during lower water levels to minimize disruption of the natural flow of the river channel.

A backwater analysis will be done before final bridge design. (Refer to the Flood Plain section of this chapter for more information.) River cross sectional measurements will be taken and modeled to ensure that construction of the structure (piers only) will not decrease the channel carrying capacity or increase the 100-year

flood plain elevation by more than that allowed by the city of Spokane's Shoreline Master Program.

Areas where runoff volumes would exceed the capacity of existing infiltration, natural channels, and storm water sewers will require additional temporary measures. Possibilities include, but are not limited to, detention basins, a transfer system (moving runoff to an area with better infiltration), and/or expanding the right of way in specific locations to include sufficient area for effective grass infiltration swales.

Temporary erosion prevention devices, such as silt fences and water quality/quantity BMPs, will be used on sensitive sites (or where required) as designated by project soil scientists and engineers. A Temporary Erosion and Sedimentation Control Plan (TESC) would be prepared. The TESC Plan is that portion of the Stormwater Site Plan covering temporary construction measures. A Stormwater Site Plan covering both temporary and permanent BMPs will be developed for each NSF construction phase. The site plan will meet NPDES requirements. A Hydraulic Project Approval (HPA) permit will be obtained from the Department of Fish and Wildlife (WDFW) prior to each NSF construction project.

Impacts — Flood Plains

In 1933, the Spokane River reached its maximum recorded discharge at 1,418,675 L/s (50,110 cfs) and still had little or no over the bank flooding.

Market/Greene Alternative (Preferred Alternative)

Construction of bridge piers at the Market/Greene crossing of the Spokane River may encroach on the regulated floodway/flood plain as designated by FEMA. Since the river banks at this site are already artificially stabilized, it is expected that any increase in high water levels due to floodway/flood plain encroachment by approved footing/pier construction methods (e.g., cofferdams) will be negligible and within the allowable limits of city shoreline and flood plain regulations.

Havana Alternative

There is currently no bridge across the Spokane River at this location. The proposed structure will be built outside the wetlands and the 100-year flood plain, except for bridge piers in the (FEMA) floodway. Construction of bridge footings/piers within the floodway/flood plain, using approved methods (e.g., cofferdams) will not alter the meander pattern of the Spokane River at the Havana crossing. Any increase in high water levels due to floodway/flood plain encroachment (piers only) will be negligible and within the allowable limits of city shoreline and flood plain regulations.

North/South Options

The project will not encroach on the regulated floodplain or floodway of the Little Spokane River. The NSF ends before reaching the Little Spokane River. Indirect impacts of project construction to the south of the Little Spokane River will be avoided by use of water quality/quantity BMPs.

Mitigation — Flood Plains

Both direct and indirect construction impacts will be avoided by use of approved bridge construction methods and temporary water quality/quantity BMPs, such as, but not limited to:

- The bridge superstructure will be constructed a minimum of 0.3 meters (1 foot) above the 100-year flood elevation.
- Bridge approach fills, and abutments will be constructed outside the 100-year flood plain.
- Bridge piers required to fall within the Spokane River will be designed to minimize obstruction of flow and constructed during periods of low water. Communication with the Corp of Engineers has shown no major problems with pier construction within the waterway zones.
- A backwater analysis will be done before final bridge design (using the FEMA computer model). This will ensure that construction techniques proposed will not decrease the channel carrying capacity or increase the 100-year flood plain elevation by more than that allowed by the city of Spokane's Shoreline Master Program.
- A Stormwater Site Plan covering both temporary and permanent water quality/quantity BMPs will be developed for each construction phase of the NSF project. The Temporary Erosion and Sediment Control Plan (TESC) is that portion of the Stormwater Site Plan covering temporary measures such as, but not limited to, silt fences, cofferdams, sediment ponds, etc. to prevent sediment from reaching rivers, streams, wetlands, or other sensitive sites during construction. The Stormwater Site Plan will also cover the requirements of NPDES.

Impacts — Water Quality Aquifer and Surface Waters

Nearly all NSF project activity will entail working within the Spokane Aquifer protection area. The EPA has directed WSDOT to confer with Spokane County over matters related to the Spokane Sole Source Aquifer. WSDOT will continue to coordinate with the county on aquifer protection. This coordination to date has enabled the updating of presented water quality data and the accuracy of this report.

There are few, if any, pathways for sediments to reach the aquifer; therefore, there would be no measurable impact on ground water quality from erosion or spilled earth. Sediments originating from the construction site could be transported to surface water bodies; however, water quality/quantity BMPs will prevent this impact.

Materials such as fuel, lubricants, solvents, or other toxic materials could be spilled during construction, or originate from existing hazardous waste sites near or within the project limits. This material could then leach to the aquifer or surface water through runoff/infiltrating. Soil contamination from existing Hazard Waste Sites within or close to the project vicinity are discussed in the Hazardous Waste sections of this chapter.

Leachate from the excavation of previously contaminated soils (for example, hydrocarbons and other toxins that may have been spilled during railroad operations

along the now vacated railroad right of way within the Market/Greene Alternative) may impact surface and ground water quality if not properly stored before transport, decontamination, or disposal. Existing hazardous waste sites are mostly found in the industrial areas of both the Market/Greene and Havana Alternatives.

Water Wells

There are five identified water supply wells within the project right of way and at least 10 within 150 meters (500 feet) of the project alternatives' centerlines (see Figures 4-15 through 4-17 in the Water Quality section of this chapter.) One well may require relocation. However, project construction will not include any activity that penetrates the water-bearing layers of the aquifer formation. At the time of writing this EIS, the surface area above the water-bearing layers of the Spokane Aquifer is considered an aquifer protection area.

The city of Spokane and Spokane County are developing a Wellhead Protection Plan to define wellhead protection areas (sensitive sites). WSDOT has coordinated with the city on public well location and will continue to request updates from the city and the county on the wellhead plan as it is developed. Once it is completed and approved, WSDOT will conform with the new wellhead protection plan.

Mitigation — Water Quality

Spill prevention and control practices that comply with EPA and DOE hazardous material handling and cleanup requirements will be adhered to during construction. Such measures address storage tank integrity, spillage during refueling, lubricant replacement practices, all procedures relating to fuel and lubricant transfer, and any cleanup required. Berms and liner installation are typical spill control measures. A TESC Plan would be prepared, including an addendum covering controls (BMPs) for pollutants other than sediment to ensure construction practices do not allow surface and ground water contamination by hazardous materials. If staging areas are on any WSDOT provided parcel, the contractor must submit a Contractor's Addendum to the TESC Plan for approval, prior to beginning construction.

The TESC Plan is that portion of the Stormwater Site Plan covering temporary measures (BMPs) such as, but not limited to, silt fences, cofferdams, sediment ponds, and other measures to prevent erosion, thus keeping sediment from reaching river or stream channels, wetlands, or other sensitive sites during construction. Steep slopes protection (BMPs) will include, but is not limited to, a combination of matting, mulching, and planting/seeding ground cover. This will protect slope and ditch stability and prevent large sediment loads from reaching stream ecosystems. A Stormwater Site Plan using both temporary and permanent BMPs will be developed for each NSF construction phase. The site plan will meet NPDES requirements.

Handling and disposing of contaminated soil/waste found within the construction site will be according to DOE/WSDOT requirements. See the Hazardous Waste section of this chapter.

Any practice involving waste water, including equipment washing, maintenance, and domestic waste, requires waste water disposal management (included in the TESC Plan). Probable disposal methods include using the existing Spokane waste water collection system or an approved and permitted septic system, or conducting such activities off site. For example, vehicles would be washed in a facility

designed to either capture all the waste water in a storage tank or route it to the waste water collection system. Stormwater Site Plans will be coordinated with the appropriate agencies.

Solid waste, such as demolition debris, will be disposed of at the Spokane Waste-to-Energy Facility or in approved solid waste landfills. Handling and disposing of hazardous waste will be according to WSDOT/DOE requirements.

Toxic spill/hazardous waste site cleanup will be in accordance with DOE (MTCA, 173-340 WAC). Special pollutant reduction strategies (combined BMPs) such as, but not limited to, specially prepared storage sites, retention tanks/lined ponds, and other best management practice measures will provide additional protection at sensitive areas. No impacts to the aquifer or surface waters are expected.

Impacts — Wetlands

Market/Greene and Havana Alternatives

Construction impacts to Wetland Area 1 at the Spokane River crossings for either the Market/Greene or Havana Alternative will be avoided. The total amount of Wetland Area 1 within the project limits is approximately 0.12 and 0.20 hectare (0.3 and 0.5 acre) respectively (proximity of the existing Greene Street structure to the proposed structure reduces the area of influence for the Market/Greene Alternative).

Impacts such as unavoidable clearing of vegetation and shading of the wetland could take place during construction of either the Market/Greene or the Havana Alternative. However, due to several factors, such as the small size of the area within the right of way, the heavy urban/industrial nature of both alternatives, the approximately 21 meter (70 foot) height of the proposed structure, and the structure's north/south orientation, no impacts to the wetlands are expected. Also, both Wetland Area 1 and the 100-year flood plain will be spanned by the proposed structure, avoiding any impacts from filling or dredging.

Wetland Area 2 would not be directly impacted by the proposed project, due to its location outside the project limits.

North Option (Preferred) and South Option

There are expected to be no direct wetland impacts along these routes.

Wetland Area 3, and a small unnamed creek, would not be impacted by the proposed project, due to their location outside the project limits.

For the North Option only, the route passes over a portion of the unnamed creek within the existing 122 meter (400 foot) culvert. No impact to the creek is expected, since the route crosses it on an overpass.

I-90 Collector/Distributor (C/D) System

There are no wetlands along this route; therefore, no wetland impacts are expected.

Mitigation — Wetlands

Any vegetation removed during construction will be replanted as soon as possible. Vegetation planted in the right of way should be species that are native, provide the best erosion control, and are aesthetically pleasing when possible.

Construction staging areas will be located well away from wetlands, rivers, and creeks.

Degraded riverbank vegetation within the project limits will be restored consistent with local and state requirements.

Restored or re-vegetated sites will be monitored to ensure successful regeneration.

Stormwater runoff will be directed to water quality and quantity treatment structures prior to discharge to rivers, creeks, and wetlands. Discharge to surface water bodies will be avoided when possible through the use of infiltration best management practices.

See Mitigation — Water Quality, above, for a discussion of Temporary Erosion and Sediment Control Plans

Impacts — Wildlife, Fisheries, and Vegetation

The most likely construction impacts would be the loss of vegetation and wildlife habitat. The study of existing conditions for each option shows heavily degraded wildlife habitat and reduced or eliminated native vegetation, due to urban development. Even the least developed areas show heavy disturbance by human activities such as off road driving and illegal dumping.

This project will not further degrade the overall habitat for wildlife. Conversion of degraded habitat to roadway right of way for the construction of the NSF is projected to have minimal or no impact.

Site surveys were coordinated with information received from involved agencies. The analysis showed no threatened or endangered species of wildlife, fish, or vegetation within any of the proposed NSF routes. Also, no significant wildlife or fish migratory or feeding route (known, recorded, or observed) was found within any of the proposed NSF routes.

Fish habitat will not be lost, but could be temporarily degraded or altered during construction, unless addressed. Excessive sediment entering a stream or river during spawning times could affect egg development and deplete insects and other food sources. Spawning times for fish will be taken into consideration during any construction near the Spokane River (the Little Spokane River is located north of the project terminus).

Construction activities include excavation, embankment construction, pile driving, and bridge/abutment construction. However, project design would include both temporary and permanent BMPs, and bridge abutment construction will be moved outside the wetlands and the 100-year flood plain. Also, construction staging areas will be located well away from wetlands, rivers, and creeks, which help prevent impacts.

Mitigation — Wildlife, Fisheries, and Vegetation

Top soil within the proposed roadbed will be removed, stockpiled, and replaced on all newly constructed areas that are to be reseeded or planted. This will improve soil productivity and increase the vigor of the plantings. Vegetation planted in the right of way will be a variety of sustainable native species that provide fast to moderate growth, hardiness, and the best erosion control, and that are the most aesthetically pleasing.

Replacement of any lost riparian vegetation along the Spokane River is essential and would help minimize any effects of freeway construction. The project will be coordinated with WDFW under HPA.

Additional construction practices will be used, when practical, to avoid erosion and sedimentation due to vegetation removal. These will include: scheduling the excavation to avoid the rainy season; minimizing siltation hazards by limiting topsoil exposure; and covering exposed soils by replanting "quick rooting" sustainable native vegetation as soon as possible.

Coordination of construction plans with WDFW and WDNR will help to eliminate any possible construction impacts to vegetation, fish, or wildlife. Refer to the Water Quality and Wetlands sections of this chapter for further information.

Stormwater runoff will be directed away from rivers, creeks, and wetlands. Discharge to surface water bodies will be avoided by use of water quality/quantity treatment areas and infiltration BMPs. Stormwater management practices as detailed in the WSDOT *Highway Runoff Manual* and the Water Quality Study for Waters of the State of Washington, WAC 173-201A would be adhered to during construction.

See Mitigation — Water Quality, above, for a discussion of Temporary Erosion and Sediment Control Plans

Social/Economic

Impacts — Farmland

Loss of Access

This alternative would not restrict access to productive prime, unique, or important farmlands of Spokane County.

Market/Greene Alternative (Preferred Alternative)

There may be temporary disruptions of access to farmlands during construction.

North and South Options

There may be temporary disruptions of access to farmlands during construction.

North Option — Havana Alternative

There may be temporary disruptions of access to farmlands during construction.

I-90 Collector/Distributor (C/D) System

This system does not restrict access to productive prime, unique, or important farmlands of Spokane County. The designated lands impacted by the project are committed to existing or future urban or semi-rural residential use.

Water Quality

It is anticipated there will be no water quality impacts on farmland productivity. Refer to the Water Quality section of this chapter for details.

Mitigation — Farmland

Disruptions of access to prime farmland property will be coordinated with property owners to help minimize impacts to the operations of that property. An alternative form of temporary access to the affected parcels will be provided to mitigate any temporary loss of access.

Any topsoil removed from areas of prime farmland will be scraped and stockpiled for other uses.

Impacts — Land Use

Temporary impacts during construction would include noise, dust, and traffic congestion. See the Noise and Air Quality discussions for details.

Mitigation — Land Use

See the Noise and Air Quality discussion for details on mitigation of temporary noise and dust impacts. See the Economic Elements discussion for details on mitigation of temporary traffic congestion during construction.

Impacts — Social Elements

Recreation

The following description of construction impacts has been developed by grouping properties with similar projected impacts together. The order is from the least to the most severe impacts.

Due to their relative distance from the project, the following properties would experience very minimal impact during construction operations. There may be some slight delays or disruptions to the major access routes to and from the recreational facilities, especially those that traverse in and around the NSF construction area. During peak periods of construction activity, the sounds of heavy equipment may be noticeable to facility users. None of these impacts is expected to impair facility use. Properties include:

- East Central Community Center
- Playfair Racetrack
- Chief Garry Park
- Cooper Elementary School
- Courtland Neighborhood Park

- John A. Shaw Junior High School
- Regal Elementary School
- Hillyard Swimming Pool
- Harmon Playfield
- Arlington Elementary School
- Mead High School
- Wandermere Golf Course

The SCC campus facilities will experience impacts similar to those described above, except that, due to their closer proximity to the construction area, the magnitude of the impacts may be greater. The main body of the campus will help serve as a buffer for the SCC recreational areas by helping block both noise and visual intrusion.

The following group of properties will experience temporary disruptions in major access routes around the NSF construction area. Walking or bikeway routes may be blocked temporarily or detoured during construction operations. Noise generated by construction (over 70 decibels) could temporarily impact users of outdoor facilities, but is not expected to impair individual facility use.

- Liberty Park
- Sheridan Elementary School
- Libby Center ~~Middle School~~
- Tuffy's Trail
- The Centennial Trail
- J. J. Hill Park/Wildhorse Playground
- Farwell Park/Farwell Elementary/Northwood Junior High School

At several locations, construction operations will be very apparent to users, due to vertical alignment of the proposed roadway, including ramps and other bridge structures. The associated use of scaffolding and falsework for bridge and retaining wall work, along with construction staging areas, will contribute to the visual clutter. BMPs will be employed to minimize temporary increases in dust and other particular matter in areas adjacent to construction operations.

The group of properties below involve direct property acquisition and will have the most severe disruptions during construction operations. There could be periods when individual facilities are closed, due to the need to move in and around the properties to access specific construction sites. Because of the close proximity to the construction area, normal users of these facilities may be deterred from using them, due to the periodic construction noise increases, disruptions of access, and other construction related impacts.

- Your Place Park
- Minnehaha Park
- Esmeralda Golf Course

- Pine Acres Golf Course

Visual intrusion of construction operations and storage areas will be very apparent. In some cases, due to vertical alignment and the need for bridge structures, the associated use of scaffolding and falsework will be visible. BMPs will be employed to minimize temporary increases in dust and other particular matter in the areas adjacent to construction operations.

Regional and Community Growth

Construction of the project would have no effect on regional or community growth.

Services

Education Facilities

Libby Center ~~Middle School~~ and Sheridan Elementary School are both within 60 meters (200 feet) of the I-90 interchange ramps. Construction noise during school hours would range from 94 decibels (dBA) within 15 meters (50 feet) of construction sites to 80 dBA within 75 meters (240 feet) of construction sites. Impacts would be temporary and sporadic throughout the work day. Construction impacts could be disruptive to activities that may take place at the closed Libby Center ~~Middle School~~ facility and to outdoor activities at Sheridan Elementary School.

Walking and bus routes may be temporarily revised during construction.

Under the Market/Greene Alternative, access to the main entrance and the transit center at SCC could be blocked during construction. The westerly portion of the parking lot would not be usable during construction. Full or partial acquisition of the administration building would be required; however, it may be possible to build over it.

Religious Institutions

Access to religious institutions would not be substantially affected during project construction.

Social Institutions

Access to existing social institutions along any of the routes would not be substantially affected by project construction.

Medical Services

There would be no construction impacts on medical services.

Fire Districts

Construction would not affect major arterials used for emergency response. If construction closes local streets, emergency vehicles would have to use alternative routes. However, this should not substantially affect emergency response time along any of the proposed routes or options.

Police Services

Construction impacts would be the same as for Fire Districts, above.

Public Services and Utilities

Public Transit

Where construction blocks neighborhood streets, some buses would have to be rerouted, but this should not substantially affect service or travel time. STA transit service to SCC would be disrupted, with a potential change in the location of the transfer station at the college.

Sewer and Water

Construction impacts on existing lines are not expected to isolate service areas or disrupt service delivery, although there is the potential for temporary disruption.

Power, Gas, Petroleum, and Rail Lines

Construction impacts would be the same as those for Sewer and Water, above.

There may be temporary disruption of BNRR rail service while overpasses are constructed.

Telephone

Impacts to telephone lines are not expected to isolate service areas or disrupt service delivery, although there is the potential for temporary disruption during construction.

TV Cable

Some TV cable routes would be temporarily disrupted during construction, and may be rerouted.

Cemeteries

Project construction is expected to have no impact on cemeteries.

Government Institutions and National Defense Installations

The South Option crosses BPA Bell Substation property. Construction may temporarily disrupt power transmission lines during construction.

Pedestrian and Bicycle Facilities

Construction will most likely have temporary impacts on existing pedestrian and bikeway facilities. Impacts may include blockage of the designated route, debris falling from construction of overpasses, open trench work for utility relocation, and operation of heavy equipment.

Mitigation — Social Elements

Community Cohesion

No mitigation is required.

Recreation

See Mitigation — Noise, earlier in this section, for measures to reduce temporary noise impacts associated with construction.

Construction contractors would be required to comply with SCAPCA regulations to minimize air quality impacts associated with construction. Construction impacts would be reduced by incorporating mitigation measures into the construction specifications for the project.

Some of the control measures that will be used to reduce the particulate pollution caused by construction are sweeping, watering, traffic control, and use of well-maintained equipment. Surface streets will be maintained free of dirt, rocks, and debris from construction activities. Since the construction will be a temporary condition only, no other measures will be necessary to control emissions.

There are no special mitigating measures for visual quality during construction.

Temporary disruptions in access will be minimized and coordinated with property owners during construction.

Regional and Community Growth

No mitigation is required.

Services

WSDOT will coordinate closely with Spokane School District No. 81 and Mead School District No. 354 to ensure the safe passage of students to and from schools during construction. Alternative access to the SCC campus will be provided if necessary; the section of the Market/Greene route that crosses the campus may be elevated to provide parking below and to maintain entry points to the campus along Greene Street.

WSDOT will coordinate closely with the city of Spokane and Spokane County fire districts and law enforcement agencies to ensure there are no disruptions to emergency response routes. Where rerouting is necessary, it will be planned well in advance of construction.

Disruptions to STA bus routes will be kept to a minimum. Where rerouting is necessary, it will be planned well in advance of construction.

WSDOT will coordinate with all affected utilities to ensure that construction does not disrupt service. Both BNRR and UPRR will be consulted to coordinate construction of overpasses, determine whether rail lines will be affected by construction, and determine impacts and mitigating measures for the rail line running to Kaiser.

US West has requested early coordination (at least five years prior to construction) regarding potential impacts to its Keystone Exchange central office located within the I-90 C/D right of way footprint. It may be that the route can be shifted slightly to the north to avoid the Keystone Exchange central office.

Impacts — Economic Elements

Employment

General contractors are selected by bid; therefore, local, regional, and national firms may be competing for the work. It is expected that many contractors will already have basic construction crews on staff. This means that much of the local hiring will be for subcontractors and individual laborers. For a project of this magnitude and duration, this could mean some periods of significant local hiring.

If a union contractor completes the work, hiring would be through local union halls, and would be heavily weighted to skilled trades people (carpenters, steel workers, cement masons and finishers) to supplement existing crews.

If out-of-town firms complete all or portions of the work, businesses that serve a transient clientele (motels, RV parks, restaurants, convenience stores, gas stations, etc.) would benefit. These businesses might hire temporary or part-time additional help.

Because basic construction materials are available in Spokane, it is expected that a large portion of materials used on the project would be purchased locally. Such materials would most likely include gravel, lumber, concrete, and steel. Purchase of these materials from local manufacturers and suppliers would contribute to local employment.

Service and retail businesses along the Sprague Avenue corridor, and industrial uses between Sprague and Mission Avenues, would experience short-term disruptions and access rerouting during construction. Businesses that rely on drive-in customer traffic may lose business because of inconvenience; some marginal businesses may fail during construction of the project. Some office leases may not be renewed in anticipation of project construction. Any of these impacts could affect employment.

Tax Revenues

There would be no impact on tax revenues as a result of construction activities.

Property Values

Because the actual construction phase is disruptive, potential buyers of residential property are less likely to invest in a home near the construction route, given an equivalent alternative elsewhere.

Temporary blockage or disruption of access, as well as noise and dust, would have short-term impacts on marketability of affected properties. Unless construction results in permanent impacts, such as closing a street, effects will be temporary. Long-term impacts could occur if street closures isolate a property or make access difficult.

Mitigation — Economic Elements

No mitigation is required.

Impacts and Mitigation- Relocation

Structurally sound residential structures may be relocated rather than demolished if economically feasible. The actual moving of structures will cause some disruptions, but all cooperating agencies will be contacted well in advance to minimize the disruptions.

Impacts and Mitigation — Cultural Resources

Noise and other activity from project construction would affect the aesthetic context of historic properties; however, this impact would be temporary.

Temporary disruptions are expected in major access routes around the NSF construction area. Walking or bikeway routes may be blocked temporarily or detoured during construction operations. Noise generated by construction (over 70 decibels) could temporarily impact users of facilities, but is not expected to impair individual facility use.

Construction operations will be very apparent to park users, due to the vertical alignment of the proposed roadway, including ramps and bridge structures. The associated use of scaffolding and falsework for bridge and retaining wall work, along with construction staging areas, will contribute to the visual clutter.

Best construction management practices will help mitigate activity common to freeway construction, such as air pollution and noise, that might affect historic properties.

In the unlikely event that additional cultural resources are encountered during construction, work will be halted pending a review by a professional archaeologist in consultation with the FHWA, Office of Archaeology and Historic Preservation, and any other appropriate agency.

Impacts — Hazardous Waste

Given the general distribution of potentially contaminated sites in the study corridor, encountering contamination during construction is highly probable. Although most land uses that may involve hazardous wastes are identified in the Hazardous Waste section of this chapter, no level of reasonable inquiry can ensure that all contamination is identified.

On the I-90 C/D, there are several smaller sites where the concern is USTs and the possible contamination associated with them. The site of major concern on this option is Budget Oil, a bulk oil storage site.

Market/Greene Alternative (Preferred Alternative)

The Market/Greene Alternative is affected by several confirmed or suspected UST sites and sites of minimal concern. The major sites of concern are the UNOCAL bulk fuel/soil remediation plant; Pacific Hide and Fur Recycling; The Plant, a chemical manufacturing facility; Koch Asphalt Co.; Aluminum Recycling Corp; the Burlington Northern Hillyard Yards; and the property around URM Stores.

Havana Alternative

The Havana Option has numerous UST sites and other sites of decreased significance. The major sites of concern on this option are the former General Electric Transformer Repair Shop (NPL Superfund site); the Spokane Fire Department Training Facility Property; a large Washington Water Power Substation; a pile of one half million tires; and two auto wrecking yards.

North Option (Preferred) and South Option

There are two NPL Superfund Sites on the South Option: the North Market Street Site and the Kaiser Aluminum Cyanide Plume. Another site of concern is the R.A. Hansen Company (adjacent). The other sites on this option are composed of UST sites, waste handlers, and an equipment wrecking yard.

The North Option may also be affected by the North Market Street and the Kaiser NPL Superfund sites, several auto wrecking yards, a bulk fuel/spray service, and several UST or AST sites.

Asbestos

Construction would require removing existing structures within the chosen NSF route, most of which have a high probability of containing asbestos materials.

Field inspections along the route will help to determine specific locations of pre-1980 structures with high probability of containing asbestos. A final on-site inspection will have to be made in order to identify the locations and amount of asbestos materials both inside and outside each structure.

Mitigation — Hazardous Waste

General

The objective of mitigation is to reduce or avoid liabilities that may be incurred by WSDOT during all phases of this project. It is WSDOT practice to conduct thorough investigations in order to identify all potentially contaminated sites as early in the project development process as possible. It is essential to identify the extent and risk of liability before property acquisition.

Avoidance

There are several methods of dealing with contaminated sites. The preferred method is avoidance. Avoidance can range from slightly altering the roadway alignment to completely avoiding a particular site.

Cleanup Options

Hazardous materials will be treated and disposed of in accordance with Federal, State and Local rules and regulations. The necessary permits will be obtained for each disposal option used. Cleanup by the currently liable party is preferable, although early identification allows WSDOT to consider accepting liability for site cleanup in order to avoid adverse schedule impacts.

Property Acquisition

As real estate issues become more complicated when contaminated or potentially contaminated property is involved. Policies and procedures for avoidance,

indemnification, appraisals, and condemnation should be reviewed and prioritized before starting the acquisition process. When construction is completed, a number of properties may be sold as excess. Most of these will likely need to meet commercial standards for potentially contaminated property. It is in WSDOT's best interest to investigate and document the conditions of all properties before the time they are acquired.

Hazardous Spills

Project design, particularly for the section over the Spokane River, would incorporate temporary and permanent spill and runoff management measures at bridge approaches, before, during, and after construction, to minimize risk to the aquifer and the Spokane River. See Mitigation — Water Quality, above, for a discussion of Temporary Erosion and Sediment Control Plans.

The contractor will prepare and implement a Spill Prevention Control, and Countermeasures Plan in accordance with EPA regulations to minimize potential contamination of soil and groundwater resulting from equipment refueling. Contingency plans will include accidental release of materials to the Spokane River during bridge construction; for example, the rupture of a hydraulic hose while operating over the river.

All underground utility lines that carry natural gas, fuels, oil or other hazardous materials will be identified and marked prior to construction. Contractors will coordinate with respective utility operators to avoid inadvertent breaching of lines.

For sites involving underground storage tanks, closure will be accomplished in accordance with the Department of Ecology Underground Storage Tank Regulations (UST) (Chapter 173-360 WAC). The regulation (WAC 173-360-395) also requires that the owner or operator of an underground storage tank system permanently closed or abandoned before 22 December 1988 shall have a person who is registered to perform site assessments conduct an assessment of the site. The owner or operator shall have a licensed tank services provider close the UST system in accordance with WAC 173-360-398, if releases from the UST may, in the judgment of the department or delegated agency, pose a current or potential threat to human health and the environment.

Asbestos

Removal procedures will be in accordance with all federal, state, and local regulations. The most recent edition of any relevant regulation, standard, document, or code shall be in effect. Where there is conflict among the requirements or with these specifications, the most stringent requirements shall govern. The Department of Labor and Industries regulates asbestos removal, encapsulation, and monitoring. A contractor must be certified in asbestos removal and there is a minimum training required for supervisors and workers. The Department of Labor must be notified unless the material contains less than one percent asbestos by volume.

All asbestos waste must be bagged, labeled, transported, and disposed of at an approved asbestos landfill according to EPA, state, and local regulations.

Hazardous Material Operations and Construction Plans

The WSDOT Hazardous Materials Contingency Plan, WSDOT Draft Guidelines for Dealing with Hazardous and Problem Waste in WSDOT, and the Draft WSDOT Hazardous Material Operations/Construction Plan will be followed. Additional site specific clean-up plans will be developed for known sites, and operating procedures will be in place for any previously unidentified contamination that may be encountered. The plans are oriented towards protection of human health, the environment, and the proper handling and disposal of hazardous material. The following points summarize these plans:

- Site inspection and characterization
- Employee training
- Personal protection equipment and safety
- Hazardous material inventory and assessment
- Removal course of action
- Sampling and chain of custody
- Discovery of previously unknown contamination
- Response plan
- Medical surveillance of personnel exposed for longer than 30 days annually

Impacts and Mitigation — Water Quality

A Temporary Erosion Sediment Control plan will be prepared. This plan includes an addendum covering controls (BMPs) for pollutants other than sediment to ensure construction practices do not allow surface and ground water contamination by hazardous materials. See Mitigation — Water Quality, above, for a discussion of Temporary Erosion and Sediment Control Plans. A Storm Water Site Plan covering both temporary and permanent BMPs will be developed for each NSF construction phase. The site plan will meet the requirements of NPDES.

Impacts and Mitigation — Air Quality

Federal, state, and local rules and regulations will be followed in handling hazardous materials. The Spokane County Air Pollution Control Authority will be consulted for technical assistance regarding issues concerning hazardous materials and air quality. A single known site, Aluminum Recycling (3412 E. Wellesley), is noted for its potential to contaminate air quality during cleanup operations. Additional investigation of proper remediation options will be initiated if the Market/Greene Alternative becomes the preferred option.

Impacts — Visual Quality

There will be temporary impacts near the construction work area. Routine construction activities such as equipment staging, detours, signs, traffic barriers, road materials, and dust will create visual disorder affecting visual quality. Most construction activities will increase freeway construction awareness for adjoining

land users. Prominent and unattractive views of the activity could be exposed to portions of the community.

Residents in rural areas, i.e., the north end and Beacon Hill, would experience greater visual impacts from construction than residents in industrial areas south of the corridor. Residents now shielded from the current roadway system by forested areas could become exposed during construction, due to removal of trees and other vegetation within the "clear zone." This would depend on individual locations in relation to the proposed facility.

Market/Greene Alternative (Preferred Alternative)

The most prominent neighborhoods already sustain considerable traffic throughout the day, particularly at the intersection of Market and Wellesley. Commercial businesses are located on Market Street roadway frontage, with the residential areas to the west of commercial sites. Residents of the area may be somewhat conditioned to the lights and glare of the heavy north and south traffic. Construction activity will temporarily increase light and glare to these residential communities.

Havana Alternative

Construction would be highly visible in the Beacon Hill and Minnehaha areas. Views of construction activity from Minnehaha Park would be more severe than in other areas due to the contrast between what now exists.

Mitigation — Visual Quality

There are no special mitigating measures for visual quality during construction.

Irreversible and Irretrievable Commitment of Resources

The proposed action involves a commitment of a range of natural, physical, human, and fiscal resources. Land used in construction of the facility is considered an irreversible commitment while the freeway exists. If a greater need arises for use of the land, or if the freeway is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will ever be necessary or desirable. Considerable amounts of fossil fuels, labor, and highway construction materials (cement, aggregate, energy, etc.) will be used in the fabrication and preparation of construction materials. These materials are not retrievable. However, they are not scarce, and their use will not have an adverse effect upon their continued availability. Any construction will also require a substantial one-time irretrievable expenditure of state and federal funds Commitment of these resources is based on the idea that residents in the immediate area, region, and state will benefit by the improved quality of the transportation system. The benefits consist of improved accessibility and safety, savings in time, and greater availability of quality services. These benefits are anticipated to outweigh the commitment of these resources to this project.

Relationship of Short-Term Uses of Environment and Long-Term Productivity

Construction of the project could have temporary impacts on noise levels, air pollution, and soil erosion. There would be some minor loss of vegetation and wildlife habitat.

Some residences and businesses, and some land that is now available for development, would be required for construction and would not be reusable. However, substitute land is available throughout the city and county for relocation of businesses and residences. Properties in the vicinity of the proposed routes would have better access to the regional transportation network, which could potentially improve business.

The more efficient movement of goods between the area north of Spokane, the Spokane Valley, the West Plains area, and the regional points served by I-90, US 2, and US 395 would enhance Spokane's long-term potential as a regional distributive center of goods and services.

Transportation improvements are based on state and local comprehensive planning that considers the need for present and future traffic requirements within the context of present and future land use. As the northern portion of the Spokane metropolitan area continues to grow (in conformity with existing land use plans and zoning patterns), a major north-south traffic link to I-90 will be necessary to support that growth. The proposed freeway would allow regional passenger and commercial traffic to cross Spokane without conflicting with or congesting local commute or commercial traffic. The project will also provide a critical link in the long-term inter-regional objectives of the Federal Highway Administration's national highway system to the United States/Canada border. Thus, the project and other infrastructure necessary to support existing land use plans will facilitate planned build-out and contribute to other associated growth.

Secondary and Cumulative Impacts

Project Impact Area

Based on current land use and zoning plans, additional commercial and industrial development is likely near the project right of way during and following construction of the project. Traffic projections include the traffic generated from this future development. Development causes an increase in impermeable surface area and increased storm water runoff rates, which will need to be handled on-site. Development may also impact ground water. Project activity may act cumulatively with other nearby activities to produce impacts on water quality. These could include: chemical transfer and storage over the Spokane Aquifer that may accidentally discharge pollutants; development of other roadways and parking areas from which hydrocarbon contaminants could reach the aquifer; and septic tank drain fields over the aquifer.

Depending on long-term goals for development within the area, secondary and cumulative wetland impacts are expected to be minimal. Increased traffic emissions,

noise, and increased highway runoff may, over time, cause a small incremental loss of wetland habitat along the banks of the Spokane River. However, the present conditions of wetlands and riparian habitat along the Spokane River, as well as the city's regulatory goal of no net loss, would limit future impacts. If impacts are unavoidable, mitigation as required under city, state, and federal wetland regulations would compensate for wetland loss.

The city of Spokane and Spokane County are under comprehensive storm water management planning. Hydraulic design for the North Spokane Freeway will use BMPs to eliminate impacts on local hydrology, storm water system hydraulics, and water quality. The city of Spokane Public Works Department is coordinating the development of the Storm Water Management Plan; plan preparation began late in 1993. Spokane County's new Storm Water Management Utility has begun preparation of a comprehensive plan to address problem drainage areas within the county's jurisdiction. In addition, the city of Spokane and Spokane County have begun to develop a Wellhead Protection Plan to define protection areas and sensitive sites. Both the city and county will be required to go through the National Pollution Discharge Elimination System (NPDES) permitting process for all construction projects.

The project will have a minor cumulative impact on farmland, unless Spokane County changes land use designations from agricultural to residential or other non-agricultural use in the affected area of northeast Spokane. Much of the area adjacent to the NSF is already zoned for non-farming use. At present, land zoned for agricultural use is being subdivided into acreage parcels for families desiring a country lifestyle. These parcels typically are at the metropolitan fringe and in accordance with county zoning.

Right of way acquired for the I-90 C/D and the North Spokane Freeway interchange with I-90 would eliminate about 420 housing units in the East Central Neighborhood. Many of these are home to low-income owners/renters. Depending on the housing market at the time of property acquisition, this displacement could have a cumulative effect on the supply of low-income housing in the Spokane area. Staged construction and right of way purchase will help offset the effect by spreading the relocation need over several years. Land acquisition for the I-90 C/D would also further disrupt the East Central Neighborhood; the northeastern and northwestern residential sections would become further isolated from the neighborhood and be susceptible to redevelopment pressure from commercial uses bordering on the north.

Whether the North Spokane Freeway interchange will result in conversion of single family housing east of Freya Street into offices or community shopping centers depends somewhat on the ramp and access system to the I-90 C/D and the North Spokane Freeway. The proposed design limits access in the vicinity of Thor/Freya to I-90 only. Access to the North Spokane Freeway is possible, but less direct, via the Liberty Park and Sprague Avenue Interchanges. This access limitation will tend to keep the area neighborhood oriented rather than result in an expanded market with increased commercial intrusion. On the other hand, the perception of a wider barrier created by the I-90 C/D could increase pressure for new retail development in areas such as south of I-90.

The project would increase accessibility to the Hillyard area, while removing through traffic from its business district, which could give the area an advantage in the competition for industrial development. The trend in this area is toward food processing and food warehousing/distributing. Direct freeway access would enhance the operational capability of these businesses, which rely on truck transport.

As the industrially zoned area builds out, low cost houses and mobile home parks may eventually be displaced. The hillside fringe area to the east and north may develop into single family use at urban densities. The northerly area, zoned semi rural, could be subjected to pressure for a change to urban density residential use. Urban density residential development beyond the crest of the side hills would require extending city of Spokane sewer -collection and water supply facilities, which is not consistent with current city or county plans.

Improved accessibility to the north suburban area would increase the demand for public services, specifically schools, and the extension of public utilities.

Pressure for community or regional commercial development beyond existing designated areas can be expected in residentially zoned land surrounding interchanges with US 2 and US 395. If such a change were made, pressure for a continuous commercial strip along the east side of US 2 between this interchange and the Northpointe Plaza area would be substantial.

It will require close coordination and evaluation of land use plans by the city and county to determine the desirability of land use changes as highlighted above. Important issues such as the Growth Management Act are still being addressed and the result of such a major development change and the associated repercussions are unknown at this time.

Discussions with city, county and other planners as to what socio-economic resources would be affected by development support the assessment drawn in our previous response to this issue. The city/county's dependence on a single source acquifer have directed growth patterns by restricting sites for new development thereby protecting water quality. Required building permits are not issued on sites where development could result in a negative effect, lower the quality or in any way deplete any of the region's limited environmental resources. In contrast the majority of the region's socio-economic resources are located in neighborhood sub-areas which are already build out to full capacity.

In the north segments of the preferred corridor (Market-Green alignment with the North option), substantial open/undeveloped areas which may be viewed as having future development potential are unlikely to undergo any change from their current land usage. Large tracts of Kaiser and Burlington Northern property will not likely become available on the real estate market. Other areas which are currently experiencing development in one form or another had their projects approved following extensive review by local agencies. Potential impacts on the area and region's environmental and socio-economic resources were reviewed to determine long term as well as short term effects. The scrutiny by local and regional permitting agencies prior to permit (project) approval will restrict the volume and type of development permitted.

The limited opportunity for future development, whether residential, commercial, or industrial, will be the same whether or not a north-south freeway corridor is ever constructed, particularly in the northeast Spokane area.

The above scenario negates the need for or the means of estimating (any analysis would be pure speculation) cumulative impacts to surface and subsurface water quality, wetlands, and wildlife habitat. Inventories of such resources as NWI mapping, USGS quads, and aerial photos would be of no avail.

Given the 20 year construction plan, coupled with already expanding development, this corridor could be close to build out without the NSF. This would require improvements to the existing streets including Market Street, Francis Avenue, Wellesley Avenue and the I-90 - Thor/Freya Interchange. Without access control, land use along these routes would change from predominately wholesale-industrial to more retail uses.

The rate of local commercial development will accelerate due to this project. Except at US 2 each of the freeway interchanges are at least partly located in areas with industrial-commercial land designations. At each interchange automobile related retail-commercial development would be located near by. The land between the interchanges has access from local streets where market demands ultimately dictate development. The addition of convenient freeway access and local city services increases the likelihood that this area will develop earlier.

North of Project Impact Area

The regional area of growth which will be enhanced by the construction of the preferred alternative is that area served by US 395 from Deer Park north to the Canadian border. This project facilitates truck traffic, the movement of freight, and serves the pleasure motorist whose origin and/or destination is Stevens, Ferry, or Pend Oreille Counties as well as the Province of British Columbia and the Fraser River valley. The project enhances the objectives of NAFTA - North America Free Trade Agreement.

The preferred alternative will encourage bi-directional residential and economic expansion, for both employer and/or employees, in Stevens County as the city of Spokane and the east valley area become more accessible. The impacts from this assumed increase in growth are constrained by laws to protect the environment. It is reasonable to assume that wetlands would continue to be protected despite the increase in demand to develop rural areas.

Within Spokane County, north of the soon to be established Growth Management Boundaries, there will be only a limited number of sub-divisions that will be allowed to develop thereby bringing about limited population density. In Stevens County, with a population base well below 200,000, the GMA is not in effect. Growth patterns already in effect in Stevens County would likely be accelerated due to the decrease in travel times to central and outlying portions of Spokane.

Without a sole-source acquifer to protect, and with the aforementioned accessibility to the Spokane Valley it is assumed that residential and commercial growth will occur in the vicinity of Deer Park. Pressure for Deer Park to become a “bedroom community” of Spokane is likely but the rural character of that community has the

potential of being protected by the governing entities. The political climate necessary to either facilitate or inhibit the growth that might otherwise occur from construction of the NSF cannot be reasonably assumed.

Re-zoning to favor industrial growth in Stevens and Pend Oreille Counties could bring about stronger economies which, with construction of the NSF, could be accelerated moderately.